Herder communities in Mongolia's free market era: Improving livestock management and reducing pastureland degradation

Lise, W.; Hess, S.M.; Purev, B.

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Overview

Mongolia, a vast, land-locked state of Northern Asia, has experienced severe environmental and socio-economic difficulties over the last decade. In 1991, communist rule collapsed and the nation adopted a free market regime; the subsequent withdrawal of Soviet economic assistance (which, at its height, represented around one-third of Mongolia's GDP) proved a heavy blow. These socio-economic hurdles were followed by environmental disasters in the form of severe winters ('dzuds') and droughts between 1999 and 2002. This had a particularly devastating effect on the country's nomadic herders, who lost 12 million animals during this period. Yet, livestock numbers are beginning to grow again: herders are taking advantage of good environmental conditions to make up for former losses. Regrettably, over-grazing and resultant pastureland degradation are liable to undermine their livelihoods if herds continue to increase beyond the land's carrying capacity. Reducing livestock numbers will not be an easy task, however; with current herd sizes, most herders already struggle to subsist. One growing solution is for pastoralists to assume a semi-commercial herding strategy, selling a portion of their meat/milk for grain at urban markets. This has several advantages: herders benefit both nutritionally and financially, and are under less pressure to expand their herd size. The Mongolian Government has already shifted its policy direction towards more productivity-oriented herding approaches and these should be further promoted. 'Herd-maximisation' should be discouraged, though policy makers must consider compensating herders for any losses associated with more conservative practices. Finally, priority should be given to introducing more viable pastureland and water management systems.

This policy brief is based on the PREM Working Papers, 'Pastureland degradation and poverty within herder communities in Mongolia: data analysis and game estimation' by Wietze Lise, Sebastiaan Hess and Byamba Purev, and 'Carrying capacity dynamics, livestock commercialisation and land degradation in Mongolia's free market era' by Ton Dietz, Enkh-Amgalan, Tumur Erdenechuluun and Sebastiaan Hess. The full reports are available online at: www.prem-online.org

Study Area

Mongolia stretches across the north of the Asian continent, its vast territory encompassing semi-desert and desert plains, grassy steppe, and mountains. These environmental conditions are particularly suitable for the herding of livestock (in particular, sheep, camels, horses, cattle, yaks and goats). Indeed, livestock herding and agriculture occupy more than 40% of the country's 2.8 million inhabitants.

This study focused on two districts or 'sums': Ugtaal (pop. 3,500) and Gurvansaikhan (pop. 2,600). These two areas vary in terms of i) pasture degradation levels, ii) ecological conditions, and iii) the impacts experienced during the extreme weather conditions of 1999-2002. The Ugtaal sum is in northern Mongolia's mountain steppe region: more rainfall and more severe winter conditions prevail. The Gurvansaikhan sum is in the south, close to the Gobi desert, and as such has less rainfall and milder winters.

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Issues facing policy-makers:

- **Do all herders consistently aim to maximise their livestock numbers, and what are the impacts associated with this 'herd-maximising behaviour'?**
- **Are there viable ways to change herders' behaviour so that they maintain livestock levels within the pastureland's carrying capacity?**
- **To what degree is the commercialisation of livestock increasing, and which policies could further encourage such productivity-orientated strategies?**
- **What other management options exist to reduce over-grazing and the degradation of pastureland?**

Pastureland carrying capacity and herder grazing strategies

In the early and mid-1990s, livestock numbers in Mongolia increased dramatically, from 25.9 million in 1990 to 32.9 million in 1998. Such growth was due to two main factors: i) good weather conditions (high rainfall, less severe winters), leading to greater pastureland carrying capacity, and ii) rising numbers of Mongolians entering the livestock economy. Yet, these gains were entirely lost between 1998 and 2002, due to severe droughts and harsh winters. By 2002, livestock levels were down to 24 million, the level of the late 1980s (also see table 1).

Despite this devastation, herding communities are beginning to recover and livestock numbers are, once again, on the increase. Concerns are now focused on the carrying capacity of Mongolia's pastureland: will over-grazing result in land degradation and hence lower economic benefits from livestock production? Researchers found that carrying capacity was more dynamic than usually assumed, varying according to i) the availability and accessibility of range lands ii) the relative usefulness of different types of biomass for livestock utilisation and iii) weather conditions (precipitation, aridity, snow-depth and temperature).

Within the last 5 years, livestock numbers have exceeded the estimated carrying capacity in some areas. Nonetheless, in both Ugtaal and Gurvansaikhan, most herders (regardless of their income) continue to maximize their herd sizes wherever possible. This is, in part, due to herders' mentality: herders feel their former losses will inevitably be recovered if they boost livestock numbers when circumstances are good. Equally relevant is that, even with the deteriorating environmental conditions, in both sums the traditional strategy of herd maximisation still leads to higher herder incomes than if herds sizes were kept constant.

Table 1: Livestock numbers in Mongolia, 1990, 1998 and 2002.

	1990	1998	2002	% change over 1990-1998	% change over 1998-2002
Horses	2.3	3.0	1.1	33%	-64%
Cattle/Yak	2.9	3.7	1.9	30%	-49%
Camels	0.5	0.4	0.3	-26%	-35%
Sheep	15.1	14.7	10.6	-3%	-28%
Goats	5.1	11.1	9.1	117%	-18%
Total	55.3	69.9	39.0	26%	-44%

Note: Total is expressed in sheep units (SU): 1 sheep = 1 SU, 1 horse = 7 SU, 1 cattle/yak = 6 SU, 1 camel = 5 SU, 1 goats = 0.9 SU.

Population Supporting Capacity and livestock commercialisation

In addition to estimating livestock carrying capacities, researchers were interested in determining the number of people Mongolia's pastures could sustain, in terms of food production. This is known as the 'population supporting capacity' of a given area of land. Calculations indicated that Mongolia's population is not being

adequately supported by current livestock production strategies: in 1998 there was 79% national food self-sufficiency based on livestock food products, but by 2002 this had dropped to 49%. Some districts fare worse than others. In Gurvansaikhan, a minimum herd of 200 animals per family is considered necessary for basic subsistence; in 2003, less than 44% of all families had more than 200 animals. There is also a growing trend of 'asset polarisation': richer pastoralists' increasingly large herds are over-grazing common pastures to the detriment of their poorer counterparts.

In order to survive, some Mongolian herders have had to seek alternative food sources outside the livestock sector, largely in the form of grain (produced domestically or imported). These are exchanged for meat, milk and cashmere. Fortunately, the caloric terms of trade (CToT) between livestock products and crops are favourable: exchange values for a calorie of meat or milk are higher (and often much higher) than the exchange values for a calorie of grains or other crops. This was particularly the case between 1998 and 2002, which meant that despite the crash in livestock numbers (and hence subsistence production), the market potential for pastoralists was excellent (see table 2). Unfortunately, most herders had not yet adjusted to a more market-oriented livestock system and therefore did not make good use of these exchange rates. This is partly due to cultural barriers, but also because marketing institutions, particularly for milk, and milk products, do not perform optimally.

Table 2:Caloric exchange rates for meat, milk and wheat in Mongolia, Ulaanbaatar, 1996-2002

	1996	1998	2000	2001	2002
meat t/kg	569	699	705	1002	1038
milk t/litre	207	401	449	519	446
wheat t/kg	120	101	102	115	120
meat/wheat	4.7	6.9	7.0	8.8	8.7
CToT meat/wheat	**8.5**	**12.4**	**12.6**	**15.8**	**15.7**
milk/wheat	1.7	4.0	4.4	4.6	3.8
CToT milk/wheat	**7.5**	**17.6**	**19.4**	**20.2**	**17.7**

Policy recommendations

Nomadic herders make up a large proportion of Mongolia's population, and as such the long-term viability of their activities has considerable policy

relevance. Their future welfare, and that of their environment, depends on encouraging i) more market-oriented livestock production approaches, ii) more sustainable herding strategies, and iii) improved land and water management systems.

Encouraging livestock commercialisation

An increasing number of Mongolian herders can no longer subsist entirely on livestock production. If nutritional needs are to be met, grains (and/or other food crops) need to play a more central role in pastoralists' diets. Although herders are beginning to pursue market-oriented livestock production strategies, policy changes could help support this challenging transition. Potential measures include i) stimulating food trade (e.g. by giving credit and training to grain providers) and ii) encouraging dietary changes (e.g. by modifying school dinners or including grain-based recipes in the popular media). The resultant benefits would be more than nutritional: herders' incomes are likely to increase, thereby reducing poverty within nomadic communities (at present, over a third of Mongolia's citizens live below the poverty line). There are also environmental advantages: as fewer livestock are required to meet herders' livelihood needs, herd-maximisation behaviour (and associated over-grazing) may be reduced.

Discouraging herd-maximising behaviour

Herders currently benefit from maximizing livestock numbers: environmental degradation has not yet proved to be a sufficiently limiting factor in this regard for most herders, although a growing number of herders realise that overgrazing and degradation of pastureland contribute to an increased vulnerability to dzuds and the severity of their losses. Such 'advanced' herders responded by shifting to more productivity-oriented strategies. Nevertheless, herd-maximisation poses a long-

term threat to pastoralists' livelihoods, particularly in areas where the carrying capacity of the land has already been surpassed. State intervention is thus required to encourage necessary livestock reductions. Clear and well-defined grazing rights will be pivotal in assuring herders that present conservative behaviour will be rewarded with future access to higher-quality pastures. This system would be best introduced in conjunction with alternative income generation activities and economic support to compensate for losses associated with limiting herd sizes (estimated to be up to 30% of income in Gurvansaikhan and up to 60% in Ugtaal).

Improving current systems of land and water management

Since the end of the Communist regime, a vacuum has arisen in the management of pasturelands and water resources. Although former collective water resources. Although former collective management systems have been replaced by a variety of informal or customary regimes, these have failed to promote sustainable and equitable practices. Improved management (including a system of grazing rights, as identified above) would help to reduce the 'asset polarization' that has come to characterize Mongolia's livestock economy and keep richer (and partly absentee) herders in check. It should also address the need for more uniform water availability, which has been compromised by a lack of adequate well maintenance: out of 41,600 wells operational in 1990, only 30,900 were still working in 2000. This has resulted in considerable over-grazing in areas where wells (and other services) are still functioning. It has also been a factor behind the demise of the traditional 'best practice' pasture use, involving up to four (seasonal) rotations. Many herders now move only twice a year, and the distance between seasonal camps has decreased. A final concern is the lack of strategic management of winter feed production. In the past, hay making areas were collectively managed and quite extensive; industrial feed production was also considerable. Over time, the production of winter feed has declined. This negative trend needs to be addressed if the livestock losses associated with severe winters are to be mitigated in the future.

PREM: In brief

The Poverty Reduction and Environmental Management (PREM) programme aims to deepen and broaden the exposure of economic researchers and policy advisors in Africa and Asia to the theory and methods of natural resource management and environmental economics. It is anticipated that this will encourage policy changes that address both poverty reduction and sustainable environmental management.

For further information about PREM, contact:
Pieter van Beukering
Institute for Environmental Studies (IVM)
Vrije Universiteit
De Boelelaan 1087
1081HV Amsterdam
The Netherlands
Tel. +31(20)5989555/Fax. +31(20)5989553

info@prem-online.org
www.prem-online.org
www.vu.nl/ivm

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